

Atty Dkt. No.: 10010469-1-1
USSN: 10/066,518

REMARKS

In view of the above amendments and the following remarks, the Examiner is respectfully requested to withdraw the rejections and allow Claims 1-19.

Claim 1 has been amended to replace the term "a sideways" with "an orthogonal". Support for this amendment may be found in the specification, e.g., at page 8, lines 24-27 and Fig. 1. Claim 1 has also been amended to replace the word "them" with "the head and substrate". Support for this amendment may be found in the specification, e.g., at page 10, lines 26-26.

Claims 20-43 are withdrawn as being drawn to non-elected subject matter. The withdrawal of claims is made without prejudice, without intent to acquiesce to any rejection, and without intent to surrender any subject matter encompassed by the withdrawn claims. Applicants expressly reserve the right to pursue subject matter of the withdrawn claims in one or more continuation and/or divisional applications.

As no new matter has been added by the above amendments, the Applicants respectfully request the entry thereof.

REJECTION UNDER 35 U.S.C. §112

Claims 1-19 are rejected under 35 U.S.C. §112, second paragraph as being indefinite for specifying "sideways orientation". Claim 1, from which Claims 2-18 depend, has been amended to specify orthogonal orientation instead of sideways orientation.

Claims 1-19 are also rejected under 35 U.S.C. §112, second paragraph as being indefinite for specifying "moving them" as it is asserted that it is unclear what "them" refers to. Claim 1 has been amended to specify the head and substrate instead of "them".

Claims 1-19 are also rejected under 35 U.S.C. §112, second paragraph as being indefinite. The Examiner asserts that the claim does not define or describe where along the path or when during the moving the drops are dispensed. The Examiner argues that such renders the claim unclear whether the method fabricates an array or the multiple arrays as claimed.

The Applicants respectfully submit that the preamble of independent Claims 1 clearly specifies a method of fabrication of multiple chemical arrays...with arrays of different sets. Claim 1 clearly describes that step (a) specifies a first array set ("moving the head in a direction along the rows of a first array set"). Likewise, step (b) clearly specifies a second array set ("then moving the head in an opposite direction along the rows of a second array set without intervening movement of

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the head in the opposite direction over all of the first array set"). Accordingly, the claims clearly describe a method of fabricating multiple chemical arrays in the form of array sets.

Furthermore, the application provides a definition of a set of arrays in the definition section of the application and FIG. 6 and FIG. 7 illustrate a method of the present invention and clearly show and describe a fabrication process and the subsequently fabricated chemical arrays that make-up the array sets 14a, 14b, 14c, etc.

Accordingly, Claims 1-19, especially when read in light of the specification, are clear and definite with respect to the fabrication of multiple chemical arrays. As such, the Applicant respectfully requests that this rejection be withdrawn.

REJECTION UNDER 35 U.S.C. §102

Claims 1-15 and 18-19 are rejected under 35 U.S.C. 102(e) as being anticipated by Fisher (US 6,232,072). The Applicants respectfully submit that Fisher does not anticipate Claims 1-15 and 18-19.

Claim 1, and the claims that depend therefrom, specify a method of array fabrication that includes (1) moving drop deposition head in a direction along the rows of a first array set, and (2) then moving the head in an opposite direction along the rows of a second array set without intervening movement of the head in the opposite direction over all of the first array set.

Fisher is directed to imaging droplets on a substrate surface. In order for droplets deposited on a substrate surface to be imaged by an imaging device, as shown in Figs. 4 and 5 of Fisher, the imaging device 60 must follow behind the heads 40 so that the heads first deposit a droplet to be imaged and then the droplet may be imaged—otherwise the imaging device would be imaging regions of a substrate before droplets are deposited (see for example col. 8, lines 4-29). Figs. 4 and 5 of Fisher show the imaging device 60 positioned to one side of the heads 40 so that it follows behind the heads 40 so it is able to image droplets deposited by the heads as they move across the substrate.

Because this arrangement of components necessarily has to be the case in Fisher in order for the invention of Fisher to function as intended, Fisher cannot include moving the heads in a direction along the rows of a first array set and then moving the heads in an opposite direction along the rows of a second array set without intervening movement of the heads in the opposite direction over all of the first set. Fisher cannot include moving the heads as claimed in the subject claims because to do so would mean that, during movement of the heads in an opposite direction along the rows of a second array set, the imaging device 60 would then be positioned ahead of, or stated otherwise in front of, heads 40 that are depositing the droplets and thus would image regions of the substrate that

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have not yet had droplets deposited thereon.

Accordingly, in order for the invention of Fisher to function properly, droplet deposition must include moving heads 40 in the direction of axis 106 from a first side of the substrate to a second opposite side to deposit droplets along the way, with imaging device 40 following behind the heads to image the deposited droplets. In this manner droplets of a first array row are provided on the substrate. Then the head is returned back to the first side and again heads 40 are moved in the same direction of axis 106 as that done previously from the first side of the substrate to the second opposite side to deposit droplets along the way with imaging device 40 following behind to image the deposited droplets. In this manner droplets of a second array row are provided on the substrate. In other words, the invention includes an intervening movement of the heads in an opposite direction (relative to the first array set) over all of the first array set and then includes moving the heads in the same direction as that of the rows of the first array set.

Since the claims specify moving a drop deposition head in a direction along the rows of a first array set and then moving the head in an opposite direction along the rows of a second array set without intervening movement of the head in the opposite direction over all of the first array set and Fisher describes moving heads in a direction along the rows of a first array set and then moving the heads in the same direction along the rows of a second array set with an intervening step of moving the heads in the opposite direction over all of the first array set, Fisher cannot anticipate the claims for at least this reason. As such, the Applicants respectfully request that this rejection be withdrawn.

Claims 1-15 and 18-19 are rejected under 35 U.S.C. 102(e) as being anticipated by Caren (US 6,323,043). The Applicants respectfully submit that Caren does not anticipate Claims 1-15 and 18-19.

As described above, Claim 1, and the claims that depend therefrom, specify a method of array fabrication that includes moving a drop deposition head in a direction along the rows of a first array set and then moving the head in an opposite direction along the rows of a second array set without intervening movement of the head in the opposite direction over all of the first array set.

Caren does not describe an array fabrication method as claimed in the subject claims. The Examiner refers to col. 12, line 40 to col. 13, line 9 of Caren to support the rejection of independent Claim 1. However, nowhere in the cited passage is any method described that includes moving a drop deposition head in a direction along the rows of a first array set and then moving the head in an opposite direction along the rows of a second array set without intervening movement of the head in the opposite direction over all of the first array set.

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When read for what it fairly teaches, the passage referred to by the Examiner describes (1) a loading sequence which does not include the claimed method, and then describes (2) a dispensing sequence (col. 12, line 65-co. 13, line 9) which also fails to describe the subject methods. For example, the dispensing sequence merely describes the positioning of the head to face a mounted substrate 10 of a substrate station 20, the selection of the load setting of the valve, and the activation of the ejectors. In regards to a deposition pattern, Caren merely describes a line by line pattern:

"Processor 140 then activates ejectors 224 in a controlled sequence while causing the positioning system to scan head 210 across substrate 10 line by line (or in some other desired pattern), to dispense droplets in a configuration which results in multiple arrays of the desired configuration on substrate 10. If necessary or desired, processor 140 can repeat the load and dispensing sequences one or more times. (col. 13, lines 3-9)

Nowhere in Caren's general description of scanning the head 210 across a substrate in a line by line pattern or in some other pattern is a method described that includes moving a drop deposition head in a direction along the rows of a first array set and then moving the head in an opposite direction along the rows of a second array set without intervening movement of the head in the opposite direction over all of the first array set, as claimed in the subject claims.

Accordingly, Caren cannot anticipate the claims for at least the reasons described above. As such, the Applicants respectfully request that this rejection be withdrawn.

Claims 1-16 and 18-19 are rejected under 35 U.S.C. 102(e) as being anticipated by Webb (US 6,613,893). The Applicants respectfully submit that Webb does not anticipate Claims 1-16 and 18-19.

As described above, Claim 1, and the claims that depend therefrom, specify a method of array fabrication that includes moving a drop deposition head in a direction along the rows of a first array set and then moving the head in an opposite direction along the rows of a second array set without intervening movement of the head in the opposite direction over all of the first array set.

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In support of the rejection of independent Claim 1, from which the other rejected claims depend, the Examiner refers to col. 7, line 48-col.9, line 55 and Fig. 4. However, this particular passage specifically describes a deposition pattern that does not include moving a head in an opposite direction along rows of a second array set, and clearly describes an intervening movement of the head in the opposite direction over all of the first array set.

Specifically, Webb describes moving a head in a second direction 204a with multiple sets of drops deposited by dispenser set E for row 15a of array column 9a, which is repeated for row 15a of array columns 9b and 9c "as the head system continues. This is shown in Fig. 4A and described at col. 8, lines 40-50. This deposition pass thus produces row 15a for each of array columns 9a, 9b and 9c as shown in FIG. 4A.

Webb then clearly describes that "Head system is then returned to the left as viewed in FIG. 4." (col. 8, lines 50-51). In other words, Webb describes an intervening movement of the head in which, after the first pass in which head 210 moves in direction 204a across the substrate to produce row 15a, the head is then moved in the opposite direction (to the left as viewed in FIG. 4A) over the multiple sets of droplets previously deposited by dispenser set E (over row 15a). Further to this point, Webb notes:

Each part of FIG. 4 shows the results of an additional pass after return of head system 210 in a direction opposite second direction 204a but before further advancement of head system 210 in first direction 63a for the next pass. (col. 8, lines 54-58)

After the head is then moved in the opposite direction (to the left as viewed in FIG. 4A) over the multiple sets of droplets previously deposited by dispenser set E, the head is advanced in the first direction 63a for the next pass across the substrate (see for example col. 8, lines 59-61; FIG. 4B). The deposition pattern described by Webb is repeated to provide nine completed arrays of twenty features each as shown in FIG. 4G.

Accordingly, Webb clearly does not describe a method of array fabrication that includes (1) moving a drop deposition head in a direction along the rows of a first array set, and then (2) moving the head in an opposite direction along the rows of a second array set without intervening movement of the head in the opposite direction over all of the first array set.

Accordingly, Webb cannot anticipate the claims for at least the reasons described above. As such, the Applicants respectfully request that this rejection be withdrawn.

Claims 1-19 are rejected under 35 U.S.C. 102(e) as being anticipated by Webb (US 6,559,693). The Applicants respectfully submit that Webb does not anticipate Claims 1-19.

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As described above, Claim 1, and the claims that depend therefrom, specify a method of array fabrication that includes moving a drop deposition head in a direction along the rows of a first array set and then moving the head in an opposite direction along the rows of a second array set without intervening movement of the head in the opposite direction over all of the first array set.

In support of the rejection of independent Claim 1, from which the other rejected claims depend, the Examiner refers generally to col. 6, line 48-col.9, line 17 and Fig. 4. However, this passage does not describe a method of array fabrication as claimed.

In describing the pattern of drop deposition, Webb merely teaches that head 210 is moved in multiple passes in the direction of arrow 204a, which direction is unit-directional as clearly indicated in FIG. 4 for example to deposit at least one drop for a feature 16a (a first pass in the direction of arrow 204a), 16b (a second pass in the direction of arrow 204a), 16c (a third pass in the direction of arrow 204a) and 16d (a fourth pass in the direction of arrow 204a). In this manner, a feature set which includes all four features 16a, 16b, 16c, 16d at a given region such as region A1 is formed only by a corresponding dispenser such as dispenser A1 for features 16a, 16b, 16c, 16d of region A1. Accordingly, Webb specifically teaches that following a first pass of head 210 and before a second pass, the head is moved in the opposite direction (the opposite to direction of arrow 204a) over the features deposited during the first pass and then moved in the same direction as that of the first pass, namely in the direction of arrow 204a.

Accordingly, Webb clearly does not describe a method of array fabrication that includes (1) moving a drop deposition head in a direction along the rows of a first array set, and then (2) moving the head in an opposite direction along the rows of a second array set without intervening movement of the head in the opposite direction over all of the first array set.

Accordingly, Webb cannot anticipate the claims for at least the reasons described above. As such, the Applicants respectfully request that this rejection be withdrawn.

DOUBLE PATENTING

Claims 1-19 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over Claims 1-18 of Webb (US 6,613,893). The Applicants submit that Claims 1-19 are patentable over Claims 1-18 of Webb.

As described above, independent Claim 1, and the claims that depend therefrom, specify a method of array fabrication that includes (1) moving a drop deposition head in a direction along the rows of a first array set, and (2) then moving the head in an opposite direction along the rows of a second array set without intervening movement of the head in the opposite direction over all of the

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first array set.

None of the claims of Webb teaches or suggests such a method. Webb includes three independent claims and none of these claims, or any claim that depends from these claims, even suggests moving a drop deposition head in a direction along the rows of a first array set, and then moving the head in an opposite direction along the rows of a second array set without intervening movement of the head in the opposite direction over all of the first array set.

For example, independent Claim 1 of Webb is repeated here for convenience:

1. A method of fabricating multiple arrays arranged successively in a first direction on a substrate and each having multiple feature sets arranged successively in the first direction within the array, using a head system having multiple successive sets of dispensers, the method comprising:

advancing the head system in the first direction over the substrate while dispensing drop sets for each array from dispenser sets onto the substrate as the head system advances in the first direction, with each dispenser set depositing a drop set at a distance ahead of a drop set deposited by a preceding dispenser set which is less than the distance to the successive drop dispenser set which deposits the next drop set, so as to form the arrays.

This claim does not even address the movement of the head after the advancement of the head system in the first direction, nor does any of Claims 2-3 and 10 that depend therefrom, and as such does not teach or suggest moving the head in an opposite direction along the rows of a second array set without intervening movement of the head in the opposite direction over all of the first array set as claimed in the subject claims.

Independent Claim 4 claims a method wherein a head system is moved in a first direction and as such does not teach or suggest moving the head in an opposite direction along the rows of a second array set without intervening movement of the head in the opposite direction over all of the first array set as claimed in the subject claims, nor does any of Claims 5-9 that depends therefrom.

Independent Claim 11 only specifies the movement of the head after the advancement of the head system in a first direction and as such does not teach or suggest moving the head in an opposite direction along the rows of a second array set without intervening movement of the head in the opposite direction over all of the first array set as claimed in the subject claims, nor does any of Claims 5-9 that depends therefrom.

For at least the reasons described above, Claim 1-19 are patentable over Claims 1-18 of Webb. As such, the Applicants respectfully request that this rejection be withdrawn.

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Claims 1-19 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over Claims 1-19 of Webb (US 6,559,693). The Applicants submit that Claims 1-19 are patentable over Claims 1-19 of Webb.

None of the claims of Webb teaches or suggests a method that includes moving a drop deposition head in a direction along the rows of a first array set, and then moving the head in an opposite direction along the rows of a second array set without intervening movement of the head in the opposite direction over all of the first array set.

Webb includes two independent claims. For example, independent Claim 1 of Webb is repeated here for convenience:

1. A method of fabricating an array with multiple sets of neighboring features comprising, for each of multiple sets of neighboring features, depositing at least one set of drops from a same corresponding pulse jet dispenser onto a substrate, at least some drops in a set of drops containing different biopolymers from one another, so as to form the array with different sets of features formed from drops deposited by respective different dispensers, the features of each same set being formed by drops deposited by a same dispenser.

This claim does not even specify any particular directional movement of the claimed pulse jet dispenser, let alone teach or suggest moving a drop deposition head in a direction along the rows of a first array set, and then moving the head in an opposite direction along the rows of a second array set without intervening movement of the head in the opposite direction over all of the first array set, as claimed in Claims 1-19 of the instant application. Claims 2-18 similarly fails to teach or suggest any particular directional movement of the claimed pulse jet dispenser, let alone a method as claimed in Claims 1-19 of the instant application.

Independent Claim 19 of Webb is repeated here for convenience:

19. A method of fabricating an array with multiple sets of neighboring features comprising, for each of multiple sets of neighboring features, depositing at least one set of drops from a same corresponding dispenser onto a substrate, at least some drops in a set of drops containing different biopolymers from one another, so as to form the array with different sets of features formed from drops deposited by respective different dispensers, the features of each same set being formed by drops deposited by a same dispenser, wherein a distance between at least two neighboring sets of features is greater than an average distance between features within the sets, both as measured in a same direction.

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Claim 19 of Webb also does not even specify any particular directional movement of the claimed pulse jet dispenser, let alone teach or suggest moving a drop deposition head in a direction along the rows of a first array set, and then moving the head in an opposite direction along the rows of a second array set without intervening movement of the head in the opposite direction over all of the first array set, as claimed in Claims 1-19 of the instant application.

For at least the reasons described above, Claim 1-19 are patentable over Claims 1-19 of Webb. As such, the Applicants respectfully request that this rejection be withdrawn.

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CONCLUSION

In view of the remarks, this application is considered to be in good and proper form for allowance and the Examiner is respectfully requested to pass this application to issue.

The Commissioner is hereby authorized to charge any fees under 37 C.F.R. §§1.16 and 1.17 which may be required by this paper, or to credit any overpayment, to Deposit Account No. 50-1078, reference no. 10010469-1.

Respectfully submitted,

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